

What is claimed is:

1 1. A data display control apparatus for receiving a
2 plurality of sets of multimedia data and a set of time
3 control information, and for controlling the display of the
4 sets of multimedia data, the plurality of sets of multimedia
5 data composing a plurality of contents which make up a
6 broadcast program, and the set of time control information
7 being used for controlling a display of the sets of
8 multimedia data,

9 the data display control apparatus comprising:

10 data storage means;

11 receiving means for extracting at least one set of
12 multimedia data and the set of time control information from
13 data transmitted from a broadcast program transmission
14 apparatus and storing the received sets of multimedia data
15 and the set of time control information into the data
16 storage means;

17 current time information obtaining means for obtaining
18 a set of current time information including an expression of
19 a current time;

20 time information judging means for judging whether
21 control relating to a display of the sets of multimedia data
22 is possible by comparing the set of current time information
23 with the set of time control information; and

24 display control means for controlling the display of
25 the sets of multimedia data based on a judging result of the

26 time information judging means.

1 2. The data display control apparatus of Claim 1, wherein
2 the set of time control information is repeatedly
3 transmitted by the broadcast program transmission apparatus.

1 3. The data display control apparatus of Claim 1, further
2 comprising:
3 link instruction receiving means for receiving an
4 instruction input by a user which specifies a new content to
5 be displayed; and

6 link instruction executing means for displaying the
7 new content according to the instruction received by the
8 link instruction receiving means.

1 4. The data display control apparatus of Claim 1, wherein
2 the receiving means also extracts the set of current
3 time information from the data transmitted from the
4 broadcast program transmission apparatus, and
5 the current time information obtaining means obtains
6 the current time information from the receiving means.

1 5. The data display control apparatus of Claim 1, wherein
2 the data storage means stores a time difference value
3 which indicates a time difference between the expression of
4 the current time in the set of current time information and

5 a standard control time in the set of time control
6 information, and

7 the control judging means refers to the time
8 difference value and corrects a content of the current time
9 information using the time difference when comparing the set
10 of current time information with the set of time control
11 information.

1 6. The data display control apparatus of Claim 5, wherein
2 the receiving means extracts the time difference value
3 and the set of current time information from the data
4 transmitted from the broadcast program transmission
5 apparatus and storing the extracted time difference value in
6 the data storage means, and

7 the current time information obtaining means obtains
8 the set of the current time information from the receiving
9 means.

1 7. A data display control apparatus for receiving a
2 plurality of sets of multimedia data that compose a
3 plurality of contents which make up a broadcast program, and
4 for controlling a display of the sets of multimedia data,
5 the data display control apparatus comprising:

6 data storage means;

7 receiving means for extracting, from data transmitted
8 from a broadcast program transmission apparatus, the

9 plurality of sets of multimedia data, at least one
10 instruction for executing a certain operation, and at least
11 one set of time control information for controlling
12 execution of at least one related instruction, the receiving
13 means storing the separated sets of multimedia data,
14 instructions, and sets of time control information into the
15 data storage means;

16 current time information obtaining means for obtaining
17 a set of current time information including an expression of
18 a current time;

19 time information judging means for judging whether
20 execution of an arbitrary instruction is possible by
21 comparing the set of current time information with a set of
22 time control information related to the arbitrary
23 instruction;

24 display control means for executing the arbitrary
25 instruction based on a judging result of the time
26 information judging means;

27 link instruction receiving means for receiving a
28 instruction input by a user which specifies a content to be
29 displayed; and

30 link instruction executing means for displaying the
31 content according to the instruction received by the link
32 instruction receiving means.

1 8. The data display control apparatus of Claim 7, wherein

the instructions are instructions that control a display of the sets of multimedia data.

9. A data display control apparatus for receiving a plurality of sets of multimedia data and a plurality of sets of time control information, and for controlling the display of the sets of multimedia data, the plurality of sets of multimedia data composing a plurality of contents which are elements of a broadcast program, each of the plurality of sets of time control information being related to a set of multimedia data and being used for controlling a display of the related set of multimedia data,

the data display control apparatus comprising:

data storage means;

receiving means for extracting at least one set of multimedia data and at least one set of time control information from data transmitted from a broadcast program transmission apparatus and for storing the sets of multimedia data and the sets of time control information into the data storage means;

current time information obtaining means for obtaining a set of current time information including an expression of a current time;

time information judging means for judging whether control relating to a display of an arbitrary set of multimedia data is possible by comparing the set of current

time information with a set of time control information related to the arbitrary set of multimedia data; display control means for controlling the display of the arbitrary set of multimedia data based on a judging result of the time information judging means; link instruction receiving means for receiving an instruction input by a user which specifies a content to be displayed; and link instruction executing means for displaying the content according to the instruction received by the link instruction receiving means.

10. A data display control apparatus for receiving a plurality of sets of multimedia data and a plurality of sets of time control information and controlling display of the sets of multimedia data, wherein the plurality of sets of multimedia data compose a plurality of contents which make up a broadcast program, and each set of time control information corresponds one of the plurality of contents, the data display control apparatus comprising: data storage means; receiving means for extracting at least one set of multimedia data and at least one set of time control information from data transmitted from a broadcast program transmission apparatus and storing the sets of multimedia data and the sets of time control information into the data

15 storage means;

16 current time information obtaining means for obtaining

17 a set of current time information including an expression of

18 a current time;

19 link instruction receiving means for receiving an

20 instruction input by a user which specifies a content to be

21 displayed;

22 link instruction executing means for displaying the

23 content according to the instruction received by the link

24 instruction receiving means;

25 time information judging means for judging, when the

26 link instruction executing means displays the content,

27 whether control relating to a display of the content is

28 possible by comparing the set of current time information

29 with a set of time control information related to the

30 displayed content; and

31 display control means for controlling the display of

32 the content based on a judging result of the time

33 information judging means.

1 11. A data display control apparatus for receiving a

2 plurality of sets of multimedia data, at least one

3 instruction, and one set of time control information related

4 to each instruction, and for controlling display of the sets

5 of multimedia data by executing the instructions, wherein

6 the plurality of sets of multimedia data compose a plurality

7 of contents which make up a broadcast program, and wherein
8 each set of time control information is used for controlling
9 execution of the related instruction,

10 the data display control apparatus comprising:

11 data storage means;

12 receiving means for extracting at least one set of
13 multimedia data, at least one instruction, and at least one
14 set of time control information from data transmitted from a
15 broadcast program transmission apparatus and storing the
16 received sets of multimedia data, the received instructions,
17 and received sets of time control information into the data
18 storage means;

19 current time information obtaining means for obtaining
20 a set of current time information including an expression of
21 a current time;

22 time information judging means for judging whether an
23 execution of an arbitrary instruction is possible by
24 comparing the set of current time information with a set of
25 time control information related to the arbitrary
26 instruction;

27 display control means for executing the arbitrary
28 instruction based on a judging result of the time
29 information judging means;

30 link instruction receiving means for receiving an
31 instruction input by a user which specifies a content to be
32 displayed; and

link instruction executing means for displaying the content according to the instruction received by the link instruction receiving means.

12. The data display control apparatus of Claim 11, wherein the sets of time control information are also related to the contents, and the display control means executes the arbitrary instruction when a content related to the set of time control information compared by the time information judging means is being displayed.

13. The data display control apparatus of Claim 11, wherein each set of time control information indicates an absolute control time and the set of current time information includes an absolute current time as the expression of a current time, and

the time information judging means judges that execution of the arbitrary instruction is possible when the control time is equal to or earlier than the absolute current time.

14. The data display control apparatus of Claim 11, wherein each set of time control information indicates a control elapsed time and the set of current time information indicates an elapsed time from a start of a display of a

current content as the expression of a current time, and
the time information judging means judges that
execution of the arbitrary instruction is possible when the
elapsed time is equal to or greater than the control elapsed
time in a set of time control information for the arbitrary
instruction.

15. A data display control apparatus for receiving a
plurality of sets of multimedia data, at least one
instruction, and at least one set of time control
information, and for controlling display of the sets of
multimedia data, wherein the plurality of sets of multimedia
data compose a plurality of contents which make up a
broadcast program, wherein the instructions are used to
control a display of the sets of multimedia data, and
wherein each set of time control information is used for
controlling execution of a related instruction and is also
related to a grouping of sets of multimedia data,

the data display control apparatus comprising:
data storage means;

receiving means for extracting, from data transmitted
from a broadcast program transmission apparatus, at least
one set of multimedia data, at least one instruction, at
least one set of time control information, and a set of
identification information for a grouping of sets of
multimedia data, and for storing the sets of multimedia

20 data, the received instructions, the received set of time
21 control information, and the received set of identification
22 information into the data storage means;

23 current time information obtaining means for obtaining
24 a set of current time information for a current time;

25 time information judging means for judging whether
26 execution of an arbitrary instruction is possible by
27 comparing the set of current time information with a set of
28 time control information related to the arbitrary
29 instruction;

30 display control means for referring to the received
31 set of identification information, and, when a set of
32 multimedia data belonging to the grouping of sets of
33 multimedia data identified by the set of identification
34 information is being displayed, executing the arbitrary
35 instruction based on a judging result of the time
36 information judging means;

37 link instruction receiving means for receiving an
38 instruction input by a user which specifies a content to be
39 displayed; and

40 link instruction executing means for displaying the
41 content according to the instruction received by the link
42 instruction receiving means.

1 16. A data display control apparatus for receiving a
2 plurality of sets of multimedia data, at least one

3 instruction, and at least one set of time control
4 information, and controlling a display of the sets of
5 multimedia data according to an operation indication input
6 by a user, wherein the plurality of sets of multimedia data
7 compose a plurality of contents which make up a broadcast
8 program, the instructions control a display of the sets of
9 multimedia data, and each set of time control information
10 relates to an execution of an instruction,

11 the data display control apparatus comprising:

12 data storage means;

13 receiving means for extracting at least one set of
14 multimedia data, at least one instruction, and at least one
15 set of time control information from data transmitted from a
16 broadcast program transmission apparatus and storing the
17 received sets of multimedia data, the received instructions,
18 and the received sets of time control information into the
19 data storage means;

20 current time information obtaining means for obtaining
21 a set of current time information for a current time;

22 operation indication receiving means for receiving the
23 operation indication input by the user;

24 time information judging means for judging, when the
25 operation indication receiving means receives the operation
26 indication, whether execution of an arbitrary instruction is
27 possible by comparing the set of time control information
28 related to the arbitrary instruction with the set of current

29 time information; and
30 display control means for executing the arbitrary
31 instruction based on the judging result of the time
32 information judging means.

1 17. A data transmission apparatus for transmitting a
2 plurality of sets of multimedia data, wherein the plurality
3 of sets of multimedia data compose a plurality of contents
4 which make up a broadcast program, the data transmission
5 apparatus comprising:

6 transmission data storage means for storing the
7 plurality of sets of multimedia data and a set of time
8 control information used for controlling display of the
9 plurality of sets of multimedia data; and

10 transmission means for transmitting the plurality of
11 sets of multimedia data and the set of time control
12 information.

1 18. The data transmission apparatus of Claim 17, wherein
2 the transmission means repeatedly transmits the set of
3 time control information.

1 19. The data transmission apparatus of Claim 17, wherein
2 the transmission data storage means further stores a
3 set of link information which shows interrelations between
4 contents in the plurality of contents, and

the transmission means also transmits the set of link information.

20. The data transmission apparatus of Claim 17 further comprising:

time measuring means for measuring a current time, wherein

the transmission means further transmits a set of current time information showing the current time.

21. The data transmission apparatus of Claim 17, wherein

the transmission data storage means stores a time difference value which indicates a time difference between the current time and a standard control time in the set of time control information, and

the transmission means further transmits the time difference value.

22. A data transmission apparatus for transmitting a plurality of sets of multimedia data, wherein the plurality of sets of multimedia data compose a plurality of contents which make up a broadcast program, the data transmission apparatus comprising:

transmission data storage means for storing the plurality of sets of multimedia data, at least one instruction for executing a certain operation, at least one

9 set of time control information for controlling an execution
10 of a related instruction, and a set of link information
11 which shows interrelations between contents in the plurality
12 of contents; and

13 transmission means for transmitting the plurality of
14 sets of multimedia data, the instructions, the sets of time
15 control information, and the set of link information.

1 23. The data transmission apparatus of Claim 22, wherein
2 each of the instructions controls a display of a set
3 of multimedia data.

4 24. A data transmission apparatus for transmitting a
5 plurality of sets of multimedia data, wherein the plurality
6 of sets of multimedia data compose a plurality of contents
7 which make up a broadcast program, the data transmission
8 apparatus comprising:

9 transmission data storage means for storing the
10 plurality of sets of multimedia data, a plurality of sets of
11 time control information that each correspond to one set of
12 multimedia data and are used to control a display of a
13 corresponding set of multimedia data, and a set of link
14 information which shows interrelations between contents in
the plurality of contents; and

transmission means for transmitting the plurality of
sets of multimedia data, the plurality of sets of time

15 control information, and the set of link information.

1 25. A data transmission apparatus for transmitting a
2 plurality of sets of multimedia data, wherein the plurality
3 of sets of multimedia data compose a plurality of contents
4 which make up a broadcast program, the data transmission
5 apparatus comprising:

6 transmission data storage means for storing the
7 plurality of sets of multimedia data, a plurality of sets of
8 time control information that each correspond to one content
9 and are used to control a display of a corresponding
10 content, and a set of link information which shows
11 interrelations between contents in the plurality of
12 contents; and

13 transmission means for transmitting the plurality of
14 sets of multimedia data, the plurality of sets of time
15 control information, and the set of link information.

1 26. A data transmission apparatus for transmitting a
2 plurality of sets of multimedia data, wherein the plurality
3 of sets of multimedia data compose a plurality of contents
4 which make up a broadcast program, the data transmission
5 apparatus comprising:

6 transmission data storage means for storing, the
7 plurality of sets of multimedia data, at least one
8 instruction for controlling display of the sets of

multimedia data, at least one set of time control information for automatically starting an execution of a related instruction; and a set of link information which shows interrelations between contents in the plurality of contents; and

transmission means for transmitting the plurality of sets of multimedia data, the instructions, the sets of time control information, and the set of link information.

27. The data transmission apparatus of Claim 26, wherein each set of time control information indicates a control time which is an indicated time.

28. The data transmission apparatus of Claim 26, wherein each set of time control information indicates a control elapsed time showing an elapsed time from a start of display of a predetermined content.

29. A data transmission apparatus for transmitting a plurality of sets of multimedia data, wherein the plurality of sets of multimedia data compose a plurality of contents which make up a broadcast program, the data transmission apparatus comprising:

transmission data storage means for storing the plurality of sets of multimedia data, at least one instruction for controlling a display of the sets of

9 multimedia data, at least one set of time control
10 information, and a set of link information which shows
11 interrelations between contents in the plurality of
12 contents, wherein each set of time control information is
13 composed of time information for an automatic start of
14 execution of one of the instructions and is related to a
15 grouping of sets of multimedia data; and

16 transmission means for transmitting the plurality of
17 sets of multimedia data, the instructions, the sets of time
18 information, and the set of link information.

19 30. A data transmission apparatus for transmitting a
20 plurality of sets of multimedia data, wherein the plurality
21 of sets of multimedia data compose a plurality of contents
22 which make up a broadcast program, the data transmission
23 apparatus comprising:

24 transmission data storage means for storing the
25 plurality of sets of multimedia data, at least one
26 instruction for controlling a display of the sets of
27 multimedia data, at least one set of time control
28 information which is used as a criterion by a reception
29 apparatus in judging whether to execute a related
30 instruction; and a set of link information which shows
31 interrelations between contents in the plurality of
32 contents; and

33 transmission means for transmitting the plurality of

sets of multimedia data, the instructions, the sets of time control information, and the set of link information.

31. A data display control information editing apparatus for displaying interrelations between a plurality of contents on a display screen and for editing, in accordance with a user operation, sets of time-related information that are used for controlling the interrelations,

the data display control information editing apparatus comprising:

data storage means for storing a plurality of pairings of a set of link information and a set of valid period information and storing a set of content control information, wherein each set of link information indicates a change in display from a first content to a second content, each set of valid period information indicates a valid period of a corresponding set of link information, and the set of content control information is used for controlling display and processing of contents;

time receiving means for receiving an indicated time input by a user; and

content relation displaying means for displaying interrelations between contents at the indicated time received by the time receiving means, based on the pairings of a set of link information and a set of valid period information which has a valid period that includes the

24 indicated time received by the time receiving means.

1 32. The data display control information editing apparatus
2 of Claim 31, further comprising:

3 content specification receiving means for receiving a
4 specification of a content input by a user; and

5 link information updating means for updating a set of
6 valid period information of a set of link information which
7 indicates a change in display to the content specified by
8 the user so that the set of link information is made invalid
9 at the indicated time received by the time receiving means.

1 33. The data display control information editing apparatus
2 of Claim 32, wherein

3 the sets of link information and the sets of valid
4 period information are transmitted from a transmission
5 apparatus used in a digital broadcast system to a data
6 display control apparatus which displays contents.

1 34. A recording medium on which a data display control
2 program is recorded, the data display control program
3 controlling a data display control apparatus which receives
4 a plurality of sets of multimedia data and a set of time
5 information and controls display of the sets of multimedia
6 data using the set of time control information, wherein the
7 plurality of sets of multimedia data compose a plurality of

8 contents which make up a broadcast program, the data display
9 control program comprising the steps of:

10 obtaining a set of current time information for a
11 current time;

12 judging whether control should be performed by the
13 data display control apparatus to display the sets of
14 multimedia data by comparing the set of current time
15 information with the set of time control information; and

16 having the data display control apparatus control a
17 display of the sets of multimedia data based on a judging
18 result of the judging step.

1 35. A recording medium on which a data display control
2 program is recorded, the data display control program
3 controlling a data display control apparatus which receives
4 a plurality of sets of multimedia data, at least one
5 instruction, and at least one set of time control
6 information related to each instruction, and controls a
7 display of the sets of multimedia data using the
8 instructions, the plurality of sets of multimedia data
9 composing a plurality of contents which make up a broadcast
10 program, and each set of time control information being used
11 for controlling an execution of the related instruction,
12 the data display control program comprising the steps
13 of:
14 obtaining a set of current time information for a

15 current time;
16 judging whether an arbitrary instruction should be
17 executed by the data display control apparatus by comparing
18 the set of current time information with a set of time
19 control information related to the arbitrary instruction;
20 having the arbitrary instruction executed by the data
21 display control apparatus based on a judging result of the
22 judging step.

1 36. A recording medium on which a data display control
2 information editing program is recorded, the data display
3 control information editing program controlling a data
4 display control information editing apparatus which displays
5 interrelations between contents on a display screen and
6 edits a set of time information used for controlling the
7 interrelations,
8 the data display control information editing program
9 comprising the steps of:
10 instructing the data display control information
11 editing apparatus to receive an input of an indicated time
12 from a user; and
13 referring to content control information for
14 controlling a display of a content and execution of a
15 predetermined process and to sets of link information that
16 each indicate a switching of display from a first content to
17 a second content, and instructing the data display control

18 information editing apparatus to display interrelations
19 between pairs of contents on the display screen at the
20 indicated time, based on the sets of link information that
21 are valid at the indicated time.